PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Rotary Pumps

I, ROBERT DESMOND PARKER, M.Sc., a British Subject, of Sunnyland, 71 Victoria Road, Holywood, Co. Down, Northern Ireland, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to rotary pumps.

According to the present invention I provide a rotary pump comprising a non-circular casing, a rotary drum mounted eccentrically in said casing, a vane carried by said drum so as to rotate therewith and slidable diametrically thereof; a crank device adapted to control the sliding movement of the vane relative to the drum, and a mounting for said device, said device comprising a disc presenting an eccentric crank pin adapted to engage the vane at its transverse axis, and said mounting comprising a recess provided in a side wall of the casing and permitting rotation of the disc therein.

Further, according to the present invention I provide a rotary pump having a rotary drum carrying a vane adapted to rotate therewith and diametrically slidable thereof, and a crank device adapted to control the sliding movement of the vane; a non-circular casing adapted to mount the drum eccentrically and having an arcuate recess on which the drum bears, said recess being concentric with the axis of the drum and being located between the inlet and outlet ports of the pump, and having its length at least equal to the width of a slot in the drum which permits the sliding movement of the vane.

Embodiments of the invention will now be described with reference to the accompanying diagrammatic drawing, in which:—

Fig. 1 is a cross sectional view of the pump at right angles to the rotary axis of the drum, and with the crank pin concentric with said axis;

Fig. 2 is a view corresponding to Fig. 1, but with the crank pin in a position eccentric to the drum axis;

Fig. 3 is an axial cross sectional view corresponding to Fig. 1; and

Fig. 4 is a view corresponding to Fig. 3 but showing a modification.

Referring to Figs. 1, 2 and 3 of the drawing, the pump consists of a solid drum 1 which is rotatably mounted and eccentrically located in a non-circular casing 2. At one end, the drum 1 is mounted and bears in a circular recess 2A in a side wall of the casing and at its other end bears against the inner surface of the opposite side wall of the casing. At the first mentioned end, the drum has a shaft 3 which extends through the casing and is provided with a crank handle or mechanical drive, not shown. The drum has a diametral slot in which a hollow or solid vane 4 is diametrally slidable, and the said slot and vane extend between the inner surfaces of the side walls of the casing, the vane bearing against the latter. The vane is of uniform rectangular and relatively thick cross section throughout its length and is provided with rounded ends 5 which contact or substantially contact the peripheral non-circular wall 6 of the casing. The line of contact or near contact which the vane 4 makes with the casing moves from one side of the vane to the other, as the vane rotates, as will be seen from Figs. 1 and 2.

The non-circular wall 6 of the casing 2 has a recessed arcuate portion 7 which is concentric with the axis of the drum 1 and on which the drum 1 bears, as shown.

The vane 4 has a transverse axial hole which houses a crank pin 8. The crank pin 8 is constrained to the circular path indicated at 9 and projects eccentrically from a circular disc 10, Fig. 3. The disc 10 is rotatably mounted and bears in a circular recess 2B in the side wall 11 of the casing, the disc lying flush with the inner surface of the wall 11, and the distance between the axes of the drum 1 and disc 10 being

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equal to the distance between the axes of the crank pin 8 and disc 10. The inlet and outlet ports of the pump are indicated respectively at 12 and 13, and the recess 7 is located between said ports and its length is at least equal to the width of the slot in which the vane 4 slides. In Fig. 2, the vane is shown with its lower end 5 held clear of the recess 7 and with its other end 5 maintaining contact with the peripheral wall of the casing, by virtue of the crank pin 8.

In the modification shown in Fig. 4, the shaft 3 is omitted and the drive is effected by a shaft 14 attached co-axially to the disc 10.

The invention thus provides a robust and effective rotary pump having a large pumping capacity in relation to its size, and which is of simple design and little liable to choking by solids which may be entrained in the liquid pumped.

The recessing of the drum and crank disc into the side walls of the casing permits the use of a vane of simple design which throughout its length extends the width of the casing and is of uniform cross section. As shown in Fig. 1, when the crank pin is concentric, or when it is nearly concentric, with the drum axis, the ends of the vane may contact the casing, but in other positions, as, for example, in Fig. 2, when the crank pin is eccentric to the drum axis, the construction of the vane is preferably such that there is a small working clearance between the ends of the vane and the casing so as to reduce friction and wear. It will be understood that the non-circular part of the casing conforms to the shape swept out by the ends of the vane during its rotary and sliding movement.

The provision of the arcuate recess 7 for the drum, ensures that the inlet and outlet ports are always effectively sealed one from the other. On one side of said recess, the leading portion of the rounded right hand end of the vane, Fig. 1, is in contact with the periphery of the casing, while on the other side, the trailing portion of the rounded end comes into contact.

In the drawings, the casing is shown as continuous, for simplicity, but it will be understood that at least one side wall is removable. Also, the drum in the first embodiment, or the disc in the second embodiment will normally be held against inward movement by means of, for example, a collar or plate concentric with one or the other and bearing on the outer surface of the wall of the casing.

It will also be understood that where parts have been described as bearing on or in contact with each other, there is a working clearance to permit efficient operation.

What I claim is:—

1. A rotary pump comprising a non-circular casing, a rotary drum mounted eccentrically in said casing, a vane carried by said drum so as to rotate therewith and slidable diametrically thereof; a crank device adapted to control the sliding movement of the vane relative to the drum, and a mounting for said device, said device comprising a disc presenting an eccentric crank pin adapted to engage the vane at its transverse axis, and said mounting comprising a recess provided in a side wall of the casing and permitting rotation of the disc therein.

2. A rotary pump comprising a rotary drum carrying a vane adapted to rotate therewith and diametrally slidable thereof, and a crank device adapted to control the sliding movement of the vane, a non-circular casing adapted to mount the drum eccentrically and having an arcuate recess on which the drum bears, said recess being concentric with the axis of the drum and being located between the inlet and outlet ports of the pump, and having its length at least equal to the width of a slot in the drum which permits the sliding movement of the vane.

3. A pump according to Claim 1, in which part of the rotary drum bears in an arcuate recess concentric with the drum axis and provided in the peripheral wall of the casing, said recess being located between the inlet and outlet ports of the pump and having its length at least equal to the width of a slot in the drum permitting the sliding movement of the vane.

4. A pump according to Claim 2, in which said crank device comprises a disc presenting an eccentric crank pin adapted to engage the vane at its transverse axis, said disc being rotatably mounted and bearing in a recess provided in a side wall of the casing of the pump.

5. A pump according to Claim 1, 3 or 4, in which the said disc lies flush with the inner surface of the side of the casing in which it is mounted.

6. A pump according to Claim 5, in which the vane throughout its length extends the full width of the interior of the casing.

7. A pump according to any preceding claim, in which the vane is of relatively thick cross section and rounded at its ends.

8. A pump according to any of Claims 2 to 7, in which the vane is retracted clear of the said arcuate recess when passing the latter.

9. A pump according to any preceding Claim, in which the arrangement of the crank device and vane is such that, when the crank is substantially concentric with the drum axis, the ends of the vane

contact the peripheral wall of the casing, while, in other positions of the crank, there is a working clearance between the said ends and said wall.

10. A pump according to any preceding claim, in which the pump is driven by a rotary shaft directly connected to the drum.

11. A pump according to any of claims 1 to 9, in which the pump is driven by a rotary shaft attached to the crank device and concentric with the axis about which the crank pin of the device revolves.

12. A rotary pump substantially as hereinbefore described with reference to the accompanying drawing.

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1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

FIG.1.

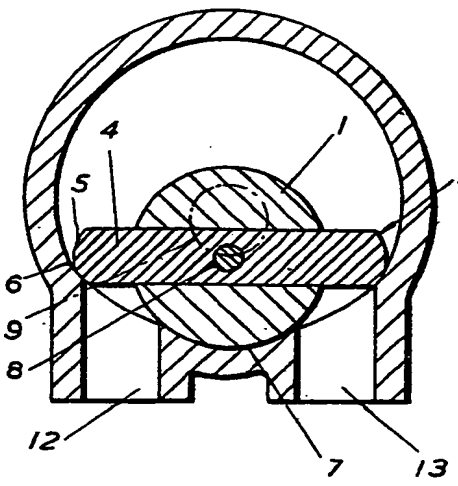

FIG.2.

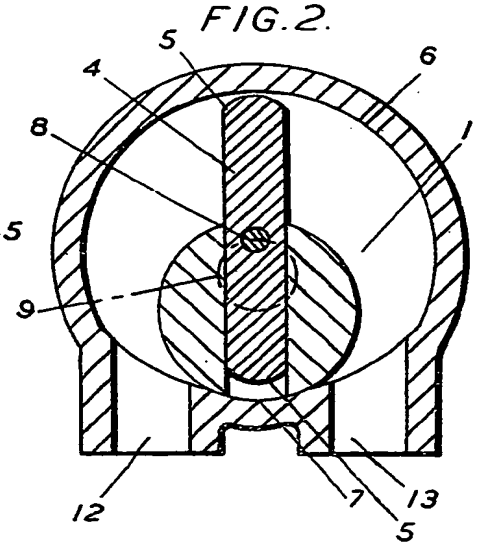

FIG.3.

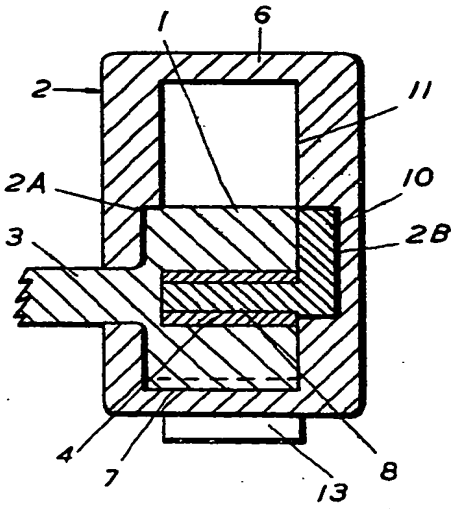

FIG.4.